

REMARKS

Claims 1-13 and 15-19 are now in the application. By this Amendment, claims 1, 8, 9, 13, 15, and 16 have been amended. Support for the amendment to claim 1 is found at least at page 8, lines 6-20, of the specification. All the claim amendments have been made to correct the antecedent basis of claim features set forth in the Office Action or to correct informalities, but not to limit the claim scope. The amendments to the claims do not introduce any new matter or create any new issues.

Applicants appreciate the courtesies extended by Examiner Pepitone to Applicants' representative during the August 4, 2008 telephone interview. The following remarks constitute Applicants' separate record of the interview.

The Office Action, at page 3, line 6 from the bottom, applies the citation to Funk et al. having U.S. Patent No. 6,043,338. However, US. 6,043,338 is by Sigwart et al. During the August 4 telephone interview, Examiner Pepitone stated that the citation applied in the Office Action is Funk et al. (US 6,036,845).

In the form PTO/SB/08 attached to the Office Action, a line is drawn through the citation to Müller (US 5,886,138). This citation has been applied in the previous Office Action with the mailing date of January 11, 2008. During the August 4 interview, Examiner Pepitone stated that this citation has been struck through because it was already of record and not because it was not considered or not in conformance with formal requirements. Applicants respectfully request that the citation to Müller (US 5,886,138) be listed on any patent that issues from this application.

Discussion

Claims 1-13 and 15-19 have been rejected under 35 U.S.C. §112, second paragraph, because some claim features of claims 1, 8, 9, 15, and 16 are allegedly unclear. Claims 1, 9, 15, and 16 have been amended to obviate this rejection.

Claims 1-13 and 15-19 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Eller et al. (WO 99/36459, as evidenced by US 6,362,312) in view of Funk et al. (US 6,036,845) and further in view of King (US 5,136,106).

Claim 1 recites, among other features, a fluidized bed. As acknowledged in the Office Action, Eller suggests a fixed-bed reactor and cannot reasonably be considered to have suggested the combination of all of the features of independent claim 1. The Office Action relies on Funk and/or King for allegedly curing the deficiencies of Eller. The analysis in the Office Action fails for at least the following reasons.

Claim 1 recites wherein the fluidized bed is operated at the fluidizing point with the expansion factor of the catalyst bed being less than or equal to 1.15 or wherein the fluidized bed is operated as an expanded fluidized bed with the expansion factor of the catalyst bed being from 1.01 to 4. The Office Action concedes that at least this feature has not been suggested by the applied citations. However, the Office Action asserts that “the claimed effects and physical properties would implicitly be achieved by carrying out the disclosed process,” and further that “the reference [sic] teaches all of the claimed reagents and process steps.”

It is unclear which disclosed process is referred to because the Office Action relies on three different citations, directed to three different chemical processes, for providing support for some - but not all - features of independent claim 1. The above-quoted feature of claim 1, admittedly nowhere disclosed in either Eller, or Funk, or King, is then asserted to be “implicitly achieved.” Apparently, the Office Action asserts that selected elements of all applied citations can be combined to a process, that this hypothetical process would inherently be performed under the above-quoted process conditions and thus, in turn, suggest all of the features of independent claim 1.

Applicants respectfully submit that a process in accordance with the pending claims necessarily encompasses all of the associated benefits of the claimed subject matter. However, none of the processes in the applied citations implicitly achieves the results of the claimed

process because each applied citation lacks several claim features. However, picking and choosing elements from the applied citations, based on the roadmap provided by Applicants' disclosure, is akin to asserting that the pending claims are obvious over Applicants' disclosure.

Further, the above-quoted feature of claim 1 is not an inherent process parameter. To the contrary, it must be carefully selected and requires, for example, an analysis of the pressure drop over the catalyst bed as a function of the superficial velocity. See page 6, lines 26-29 of the specification. In other words, it is possible that the fluidized bed is operated at the fluidizing point with the expansion factor of the catalyst bed being greater than 1.15. However, if the hypothetical process proposed in the Office Action could be performed with an expansion factor outside the claimed range, it cannot be said that the claimed range is an inherent feature of the process according to claim 1.

As demanded by legal precedence, inherency requires that the recited result or structure must necessarily be obtained not merely that it might be achieved. See *Electra Medical Systems S.A. v. Cooper Life Sciences, Inc.*, 32 USPQ2d 1017 (Fed. Cir. 1994); *In re Oelrich*, 212 USPQ 323 (CCPA 1981) and *In re Robertson*, 49 USPQ2d 1949 (Fed. Cir. 1999).

As set for the in MPEP §2112 (IV), "[i]n relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original). This burden has not been met in the Office Action. As set forth above, Eller suggests a fixed-bed catalyst. Accordingly, the above-quoted features of claim 1 cannot reasonably be considered to flow from Eller because Eller suggests that the catalyst material remains stationary in the reactor.

Further, the application of Funk likewise would not result in a suggestion of the above-quoted features. Funk suggests a catalytic reforming process for reforming paraffinic and naphthenic hydrocarbons. As indicated at col. 8, line 52 to col. 9, line 59, the reactants and

products are in the vapor phase. As such, Funk is concerned with small molecules having a comparably low viscosity and with a reforming reaction in which the viscosity of the vapor stream changes insignificantly, if at all. Eller, on the other hand, suggests a polymerization reaction for the production of polymers wherein the viscosity increases throughout the process. In a fixed-bed reactor, a concentration gradient builds up between the inlet and the outlet. Because the catalyst material is stationary in the process suggested by Eller, this citation does not provide a suggestion for performing a polymerization with a fluidized bed catalyst. However, incorporating the fluidized-bed catalyst of Funk in the fixed-bed catalyst of Eller would result in catalyst particles that are either not fluidized or are carried out of the reactor unless the change of viscosity in the reaction mixture is taken into account. Funk cannot reasonably be considered to have suggested how to perform the polymerization reaction of Eller with a fluidized bed catalyst because the reformation reaction suggested in Funk takes place with no or only small changes in the viscosity of reactants and products in the vapor phase.

Likewise, King suggests the ring-opening polymerization of highly strained epoxides. The resulting polymers contain a terminal alcohol and the repeating unit $[-CH_2-CH_2-O-]$. Accordingly, the reactants and products are different and have, therefore, different viscosities than the claimed reactants and products. Of utmost importance is that King, while mentioning a fluidized reactor in passing, fails to recognize that the expansion factor of the catalyst bed is a result-effective variable in a fluidized bed polymerization. Almost all polymerization examples disclosed in King are directed to a batch-wise polymerization in a Parr bomb. Only one, example 15, is directed to a polymerization in a recirculating loop reactor, comprising a fixed-bed catalyst. However, as set forth in MPEP §2144.05 II (B), only result-effective variables can be optimized. Specifically, “[a] particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation.” *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977).

Applicants respectfully submit that in the embodiments according to a fluidized bed and an expanded fluidized bed recited in claim 1, the reaction mixture becomes uniformly distributed. In both embodiments, the fluidization is carried out such that no significant amount of catalyst is discharged from the polymerization reactor. As set forth in the specification on page 6, lines 1-7, the optimal flow rate, expressed, for example, by the superficial velocity, has to be adapted to the fluidized bed or to the expanded fluidized bed at the fluidizing point. The optimal flow rate depends on the viscosity and density of the reaction medium and also on the properties of the catalyst particles, in particular their size, shape, density and porosity. The specification clearly enables a skilled artisan to determine the optimal parameters, for example, at page 6, lines 24 to 31.

Further, even if it was permissible to modify the references as suggested, the Office Action has used impermissible hindsight reasoning in manufacturing its rejection of the claims.

Focusing on the obviousness of substitutions or differences is improper; rather, the claimed invention must be considered as a whole. *Gillette Co. v. S.C. Johnson & Son Inc.*, 919 F.2d 720, 724 (Fed. Cir. 1990). Moreover, it is impermissible simply to engage in a hindsight reconstruction of the claimed invention, using the patent as the template and selecting elements from references to fill the gaps. E.g., *In re Rouffet*, 149 F.3d 1350, 1358 (Fed. Cir. 1998), citing *In re Gorman*, 933 F.2d 982, 986 (Fed. Cir. 1991), citing in turn *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1143 (Fed. Cir. 1985).

Simply because claim features may be known in the art is insufficient for a finding of obviousness. “[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR Int’l v. Teleflex Inc.* 127 S. Ct. 1727, 1731 (2007). Rather, there must be a well reasoned or articulated rationale to combine the references or “something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination.” E.g., *Rouffet* 149 F.3d at 1356, and the cases cited therein. See also *In re Fulton*, 391 F.3d 1195, 1200 (Fed. Cir. 2004), citing *Rouffet*; *Sibia Neurosciences*, 225 F.3d at 1356; *ATD Corp. v. Lydall, Inc.*, 159 F.3d 534,

546 (Fed. Cir. 1998). As variously stated by the Federal Circuit, there must be some reason, teaching, suggestion, interference, motivation, or incentive in the prior art to make the selections made by the inventor and combine the prior art to produce the claimed invention. E.g., *Rouffet*, 149 F.3d at 1355; *Pro-Mold and Tool Co. v. Great Lakes Plastics Inc.*, 75 F.3d 1568, 1573 (Fed. Cir. 1996); *Gorman*, 933 F.2d at 986-987; and *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 297 n.24 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986). Further, a motivation to combine only flows from the combination that is, on balance, desirable, not merely feasible. See *In re Fulton*, 391 F.3d at 1200, citing *Winner Int'l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 (Fed. Cir. 2000). As explained by the Winner Int'l Royalty Corp. court, “[t]rade-offs often concern what is feasible not what is, on balance, desirable. Motivation to combine requires the latter.”

The United States Supreme Court, in *KSR Int'l*, 127 S. Ct. at 1740-41, cited with approval the Federal Circuit’s reasoning that “rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). Accordingly, even if the references could somehow be interpreted to together teach all of the features of the claimed subject matter, the Office Action failed to provide a proper rationale as to why a skilled artisan would have combined Eller with Funk and King to achieve the presently claimed subject matter.

The reasons set forth in the Office Action are insufficient to explain why a skilled artisan would have been motivated to combine the applied references in the proposed manner. The Office Action asserts that one having ordinary skill in the art would have been motivated to combine all three references because Funk suggest an equivalent alternative means of providing a continuous reactor for THF polymerization. However, as set forth above, Funk does neither suggest a polymerization reaction nor THF as a reactant. In addition, the Office Action asserts that King provides evidence that fluidized bed reactors are utilized for the production of polyethers from cyclic ethers. However, as set forth above, King suggests the alkoxylation of ring-strained epoxides and has no relation at all to a polymerization of tetrahydrofuran. Further,

King suggests, at col. 7, lines 14-16, that the lack of catalytic activity of certain anion-bound shows the unexpected nature of the invention. Thus, a person of ordinary skill in the art would conclude that the teachings in King cannot readily be applied to a completely different chemical system with different reactants and products.

In view of the above, consideration and allowance are, therefore, respectfully solicited.

In the event that the Examiner believes an interview might serve to advance the prosecution of this application in any way, the undersigned attorney is available at the telephone number noted below.

Applicants believe no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 03-2775, under Order No. 13156-00013-US from which the undersigned is authorized to draw.

Dated: October 8, 2008

Respectfully submitted,

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